

Remarks and Argument

The instant application as filed contained claims 1-24. By Office Action dated January 5, 2005, the claims were subject to restriction and/or election. Applicant elected with traverse to withdraw from consideration method claims 21-24. The election requirement was made final by the most recent Office Action dated March 25, 2005. Further, as set forth therein, the Examiner has allowed claims 17-20, rejected claims 1-5, 9, 10, 12 and 13, and objected to claims 6-8, 11 and 14-16. Said objected to claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1-5, 9, 10, 12 and 13 were rejected by the Examiner under 35 U.S.C. § 102(b) as being unpatentable over Frankland (U.S. Patent No. 5,567,448). The Examiner concluded that Frankland discloses a first cylindrical shell (44), and a second cylindrical shell (70) surrounding the first shell (44) and defining a cylindrical annular space (60) therebetween having an axial length and a periphery. More specifically, it is contended that Frankland shows a first flow channel (80), having a first inlet (34) and the first outlet (either 38 or just left of the lead line (52)). A second flow channel (82) is described as extending along a second portion of the axial length and around the periphery of the annular space from a second inlet (just left of lead line (52)) and a second outlet (just right of lead line (54)). A transverse seal (50) is described by the Examiner in Frankland as passing between the second inlet and the second outlet.

Applicant appreciates the Examiner's findings. With this Response and Amendment, claims 1, 3-5, 9 and 13 were amended to better describe the instant invention claimed therein. This amendment is supported by the disclosure in the application.

Discussion

Claims 1 and 9 have been amended to further describe the second flow channel being separated from the first flow channel so that fluid flow does not pass therebetween. Further, claim 5 was amended to describe the same between the second flow channel and the third flow channel. Frankland is a roll having a continuous single channel wherein inlet (34) provides the passage for supplying a liquid temperature controlling medium to the shell assembly (40). More specifically, the liquid medium travels through duct (32) and into radially-extended duct (34) which is in liquid communication with the first spiral passage (80) and into the second spiral passage (82). After flowing through the second spiral passage (82), the liquid flow in Frankland continues and passes into the third spiral passage (84) before exiting through duct (38). The liquid medium is then directed into a return conduit. See, Frankland at col. 6, lns. 40-61. As a result, there is only a single channel temperature gradient throughout the axial length of the roll, namely the first (80), second (82) and third (84) spiral passages, and ultimately the temperature of the outer shell (70) of Frankland is controlled by a single source of heat transfer medium.

The instant invention discloses a roll having separated channels for heat transfer and, without being limited to this use, it can be used with a molten sheet having varied thickness or compositional cross sectional profiles. As described in the specifications, different cross sectional profiles will have varied solidification times at, for example, the thicker and thinner portions of the sheet. With the instant invention, the cooling rate of the thicker profiles can be increased so that it substantially matches the cooling rate of the thinner profiles. Thus, the heat transfer liquid may be continuously pumped through the first channel, separate for the heat transfer liquid in the second channel, to heat or cool at different rates the corresponding first and second portions along the axial length of the roll. As a result, the multiple thermal channel roll,

according to the present invention, allows a wider operating range of thicker versus thinner sheet profiles due to the separate heating/cooling ranges between thermal channels.

With the amendment of claims 1 and 9, the first and second flow channels must be sealed from fluid flow directly passing therebetween. Otherwise, like Frankland, the heating/cooling rates between these channels cannot be varied to better accommodate the processing of rolled sheets having different cross sectional profiles.

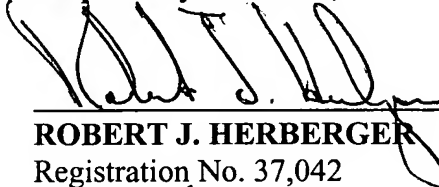
Conclusion

The Examiner's indication of allowable claims 17-20, as well as claims 6 through 8, 11 and 14-16 (if rewritten in independent form as stated above) is noted with appreciation. Applicant believes that independent claims 1 and 9, and dependent claims 3-5 and 13 as amended, as well as the remaining dependant claims, are acceptable as a result thereof and the comments made herein. With the same, the application should now be in a condition for allowance.

The Examiner is respectfully urged to contact the undersigned attorney if there are any further matters standing in the way of the allowance. Applicant respectfully requests that the instant application be passed to issuance.

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Respectfully submitted,



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